

WHAT IS CLAIMED IS:

1. A method for controlling water quality in a nuclear reactor comprising the steps of:

making an amount of iron, which is carried into the nuclear reactor and corrosively eluted from structural material within the nuclear reactor into reactor water, at least twice as much as any one of an amount of nickel, which is carried into the nuclear reactor, and an amount of nickel, which is generated in the nuclear reactor; and

limiting an upper limit of concentration value of iron in system water supplied into the nuclear reactor to up to 0.10 ppb.

10 2. The method as claimed in Claim 1, wherein:

the upper limit of concentration value of the iron is limited to up to 0.04 ppb.

15 3. The method as claimed in Claim 1, wherein:

a preliminary oxidation treatment is applied to nickel base alloy material, which is used in a feed water heater and a fuel assembly of the nuclear reactor.

4. The method as claimed in Claim 1, further comprising the step of:

introducing natural zinc into the reactor water to limit a zinc ion concentration value to up to 5 ppb.

20 5. A nuclear power plant comprising piping and equipment disposed on a nuclear reactor first order system, wherein:

the piping and the equipment are made of stainless steel.

6. The nuclear power plant as claimed in Claim 5, wherein:

25 the nuclear reactor first order system is provided with a reactor water high-temperature purifying device for causing nickel to be

occluded in filter medium of any one of ferrite and ferritic alloy.

7. The nuclear power plant as claimed in Claim 5, wherein:

a feed water heater and a fuel assembly of the nuclear reactor are made of ferrite.

5 8. The nuclear power plant as claimed in Claim 5, further comprising:

an iron removing device for removing iron from system water supplied into the nuclear reactor.

9. The nuclear power plant as claimed in Claim 8, wherein:

the iron removing device removes iron in a form of granule and ion in case where the system water is condensate having a low temperature, and removes iron mainly in a form of granule in case where the system water is drain water having a medium or high temperature.

10. The nuclear power plant as claimed in Claim 9, wherein:

the iron removing device used when the system water has the low temperature is a composite removing unit, which comprises a filter having pores with a diameter of up to 0.45 µm as well as a large filtration area and an ion exchange resin tower.

11. The nuclear power plant as claimed in Claim 9, wherein:

20 the iron removing device used when the system water has the medium or high temperature is a removing unit having a filter, which has pores with a diameter of up to 0.45 µm and is formed of at least one selected from the group consisting of heat resistant resin, ceramics, elements forming ceramics through oxidation, carbonization and nitriding, and carbon material.

25 12. The nuclear power plant as claimed in any one of Claims 5 to 11,

wherein:

material used for reactor core structural material of the nuclear reactor has a cobalt content of up to 0.01 %.

13. The nuclear power plant as claimed in any one of Claims 5 to 11,

5 wherein:

turbine blades and large-diameter valves disposed on the nuclear reactor first order system are made of nickel-base alloy.